10A, 600V Ultra Fast Surface Mount Rectifier

FEATURES

- AEC-Q101 qualified
- Planar technology
- Low power loss, high efficiency
- Ideal for automated placement
- Wettable flank
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free

APPLICATIONS

- DC to DC converter
- Automotive application
- Car lighting
- Snubber
- Freewheeling application

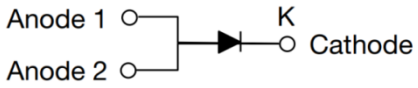
MECHANICAL DATA

- Case: TO-277A (SMPC4.6U)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.104g (approximately)

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
I_F	10	A
V_{RRM}	600	V
I_{FSM}	115	A
$T_{J\,MAX}$	175	°C
Package	TO-277A (SMPC4.6U)	
Configuration	Single die	

Pb-Free RoHS COMPLIANT HALOGEN FREE

TO-277A (SMPC4.6U)



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)				
PARAMETER		**SYMBOL**	**VALUE**	**UNIT**
Repetitive peak reverse voltage		V_{RRM}	600	V
Reverse voltage, total rms value		$V_{R(RMS)}$	420	V
Forward current		I_F	10	A
Surge peak forward current single half sine-wave superimposed on rated load	t = 8.3ms	I_{FSM}	115	A
	t = 1.0ms		260	
Junction temperature		T_J	-55 to +175	°C
Storage temperature		T_{STG}	-55 to +175	°C

THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance(1)	$R_{\Theta JL}$	2	°C/W
Junction-to-ambient thermal resistance(2)	$R_{\Theta JA}$	46	°C/W
Junction-to-case thermal resistance(2)	$R_{\Theta JC}$	7	°C/W

Thermal Performance Notes:

1. With ideal heat sink
2. Units mounted on PCB (16mm x 16mm Cu pad test board)

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage(1)	I_F = 5A, T_J = 25°C	V_F	1.35	-	V
	I_F = 10A, T_J = 25°C		1.53	1.8	V
	I_F = 5A, T_J = 125°C		1.04	-	V
	I_F = 10A, T_J = 125°C		1.24	-	V
Reverse current @ rated V_R(2)	T_J = 25°C	I_R	-	5	μA
	T_J = 125°C		6	-	μA
Junction capacitance	1MHz, V_R = 4.0V	C_J		-	pF
Reverse recovery time	I_F = 0.5A, I_R = 1.0A, I_{rr} = 0.25A	t_{rr}	-	25	ns
	I_F = 1.0A, di/dt = 50A/μs, V_R = 30V		28	-	
Reverse recovery current	I_F = 10A, di/dt = 200A/μs, V_R = 400V	I_{RM}	2.7	-	A
Reverse recovery charge		Q_{rr}	150	-	nC
Reverse recovery time		t_{rr}	76	-	ns

Notes:

1. Pulse test with PW = 0.3ms
2. Pulse test with PW = 30ms

ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
PUUP10JH	TO-277A (SMPC4.6U)	6,000 / Tape & Reel

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Forward Current Derating Curve

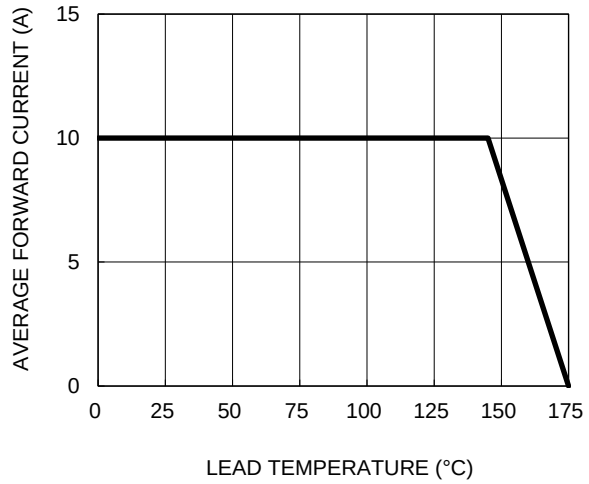


Fig.2 Typical Junction Capacitance

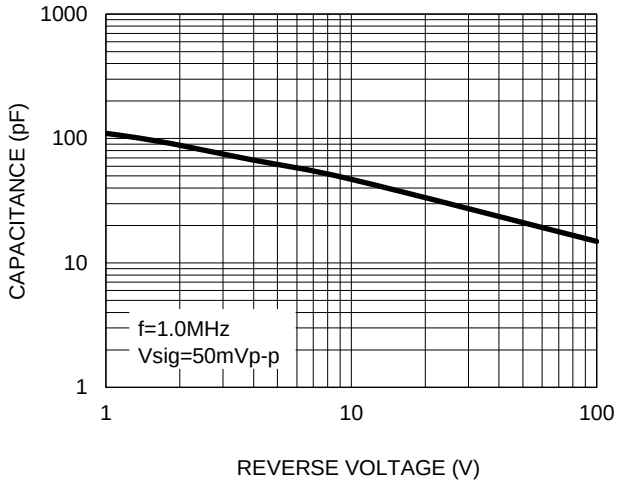


Fig.3 Typical Reverse Characteristics

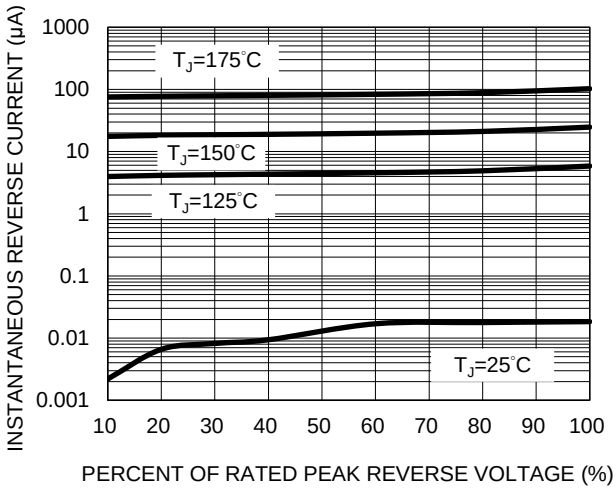


Fig.4 Typical Forward Characteristics

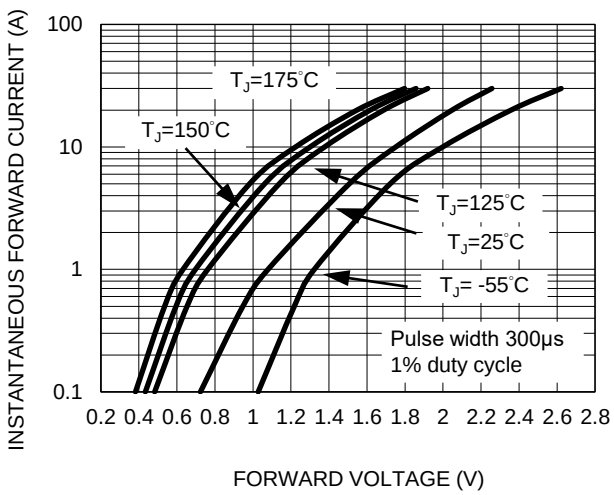
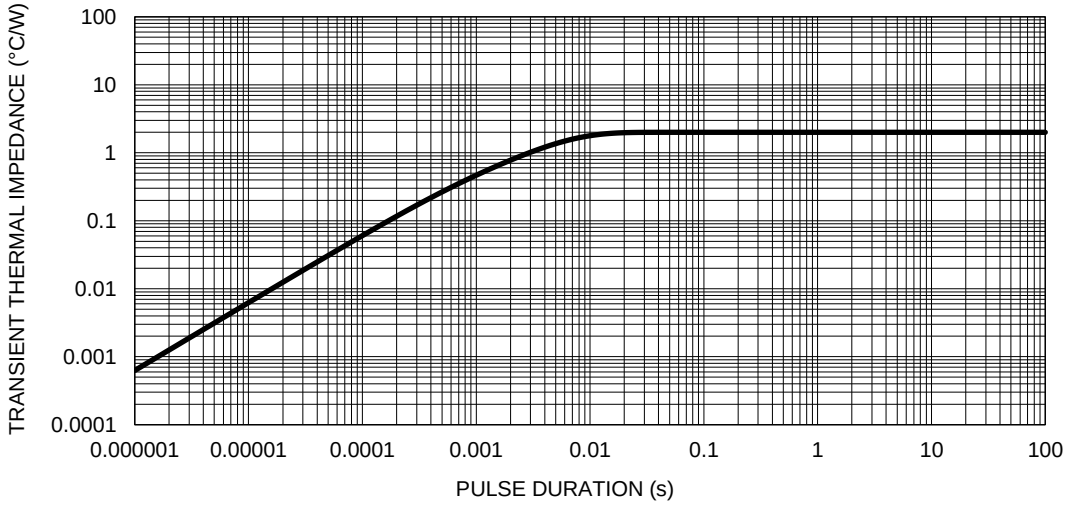
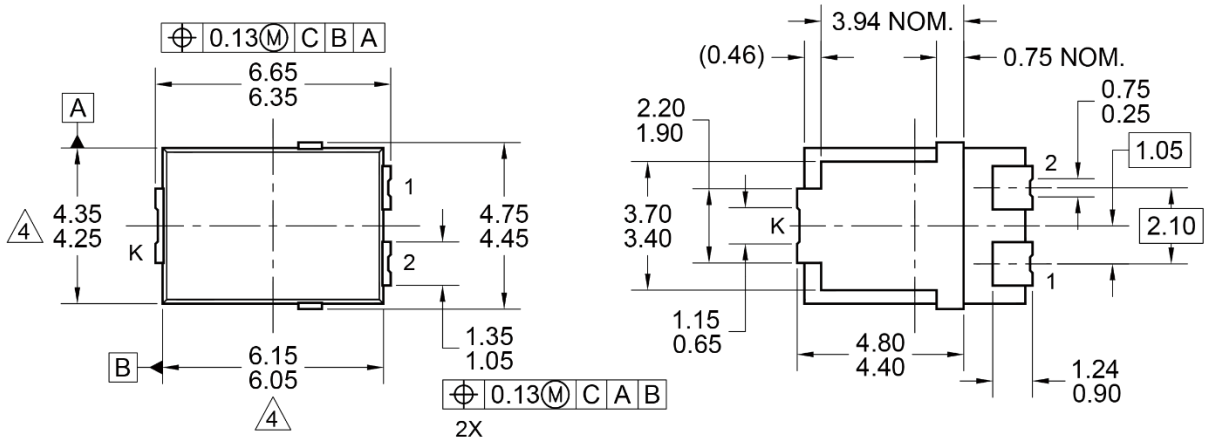


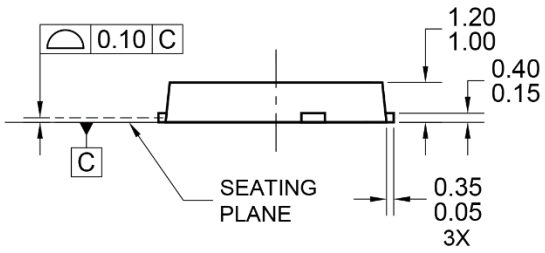
Fig.5 Typical Transient Thermal Impedance

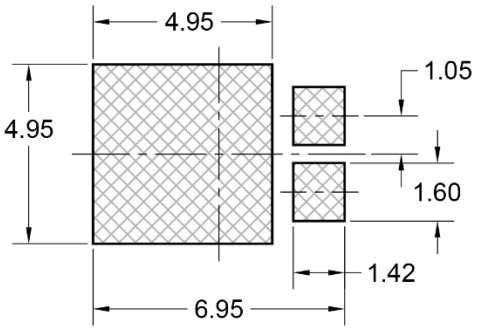


PACKAGE OUTLINE DIMENSIONS

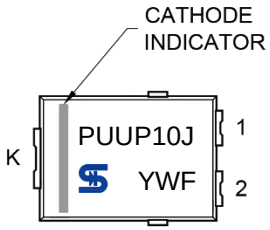
TO-277A (SMPC4.6U)







SUGGESTED PAD LAYOUT
(REFERENCE ONLY)



MARKING DIAGRAM

YW = DATE CODE
F = FACTORY CODE

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: JEDEC TO-277 ISSUE A.
4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD LASH, PROTRUSIONS OR GATE BURRS.
5. DWG NO. REF: HQ2SD07-SMPC4.6U-031 REV A.

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